# Primrose Schools

Affiliated to the CISCE Board for ICSE & ISC
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## NATIONAL PRIMTALENT OLYMPIAD EXAMINATIONS
# MATHEMATICS

| CLASS 9 | Name : |
| | Section : |
| | Roll no : |

| | **Guidelines for the Candidates** |
|---|---|
| 1 | Please check your Name, Class and Section on the OMR sheet provided to you. |
| 2 | In case, OMR sheet with your name is missing, please fill in information about yourself in the blank sheet provided before start of exam. |
| 3 | All questions are compulsory. There is no negative marking. Use of calculator is not permitted. |
| 4 | There is only **ONE** correct answer. Choose only ONE option for an answer. |
| 5 | To mark your choice of answers by darkening the circles in OMR sheet, use **HB Pencil or Blue/Black ball point pen** only. |
| 6 | Rough work should be done in the blank space provided in the booklet. |
| 7 | Return the OMR sheet to the invigilator at the end of the exam |
| 8 | Please fill in your personal details in space on the top of this page before attempting the paper |
| | |

## SECTION A – LOGICAL REASONING

1. In the given figure if Triangle represents healthy people, Rectangle represents old persons and Circle represents men then What is the number of those men who are healthy but not old ?
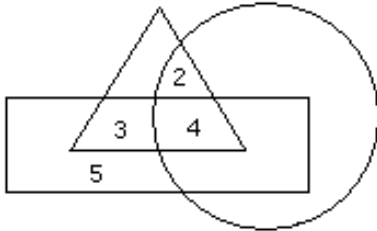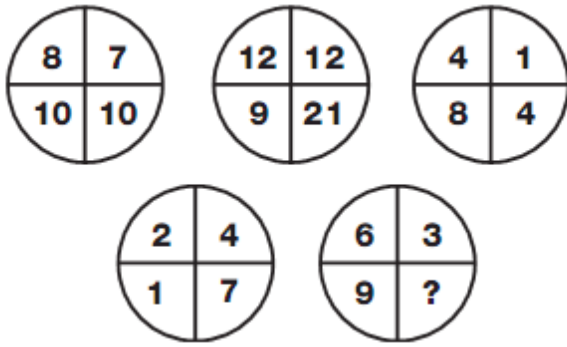


A. 3
B. 2
C. 10
C. 4

2. Find the figure which most closely resembles the unfolded piece of paper.



A. 
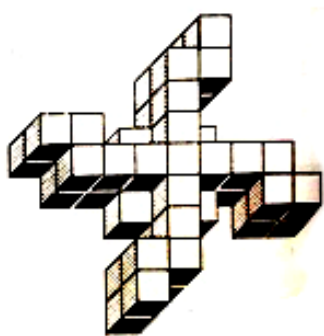
B. 

C. 

D. 
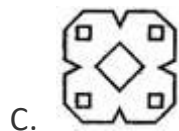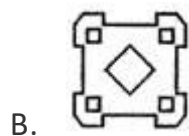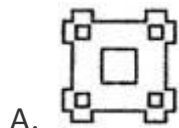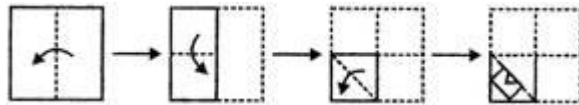
3. Which number replaces the question mark ?



A. 3
B. 4
C. 5
D. 6

4. Choose the odd one out.

A. 

B. 

C. 

D. 

5. Some equal cubes are arranged in the form of a solid block as shown in the given figure. Count the number of cubes in the given figure.

A. 45
B. 48
C. 46
D. 49

6. If 'AND' is written as 'EQF' and 'THE' as 'XKG' then how will 'COM' be written?

A. HRO

B. GQO

C. GRO

D. GRN

7. Choose the figure which is different from the rest.



(1)   (2)   (3)   (4)   (5)
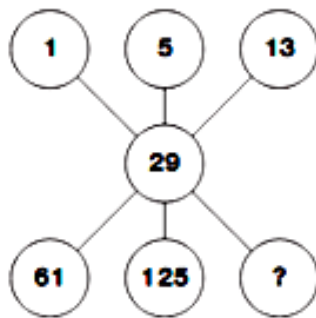
A. 1
B. 2
C. 3
D. 5

8. If each edge of this shape is tripled, what will happen to its volume ?



A. The volume will be multiplied by 27.
B. The volume will be multiplied by 3.
C. The volume will be multiplied by 9.
D. The volume will be multiplied by 6.

9.  Which number replaces the question mark ?



A. 111
B. 222
C. 253
D. 267

10.  Arrange each of the five words in the questions below in a meaningful sequences.

| 1. | Index |
|----|-------|
| 2. | Contents |
| 3. | Heading |
| 4. | Chapter |
| 5. | Preface |

A. 2,3,4,5,1
B. 5,1,4,2,3
C. 3,2,5,1,4
D. 3,5,2,4,1

## SECTION B – MATHEMATICAL REASONING

11.  Find $x + y + z + w$
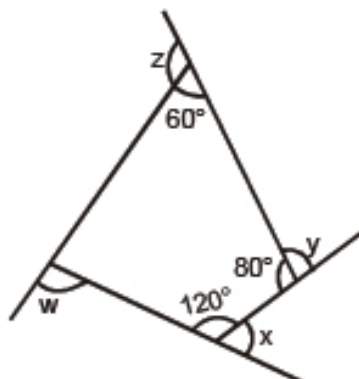
A. 3600
B. 1800
C. 1000
D. 2000

12. There is a number that fulfils all of the following criteria/rules:

=>It is prime.
=>It is a whole number.
=>It is greater than or equal to 1.
=> If you double it, square it, and add itself to it, you get the same single digit even number answer for each operation.
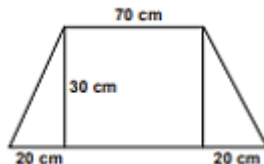What is this number?

A. 1
B. 2
C. 3
D. 7

13. $$\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \text{.......} + \frac{1}{\sqrt{8}+\sqrt{9}} = ?$$

A. 2
B. -4
C. 4
D. -2

14. Two carpenters decided to design desks for students at the Sun High school. The dimensions of the desk are as as shown. How much wood ( in cm2 ) would they need for 45 desks ?



A. 2700 cm2
B. 80000 cm2
C. 21000 cm2
D. 81000 cm2

15. In a 2 – digit number , ten's digit is twice the unit digit . If the sum of the digits is 9, find the number.

   A. 36
   B. 63
   C. 45
   D. 54

16. Sum of three consecutive numbers is 2262. What is 41 % of the highest number ?

   A. 301.51
   B. 309.55
   C. 303.24
   D.308.73

17. Suresh starting from his house goes 4 km in the East, then he turns to his right and goes 3 km. What minimum distance will be covered by him to come back to his house ?
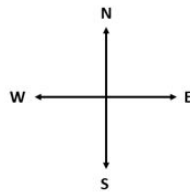


   A. 3 Km
   B. 5 Km
   C. 7 Km
   D. 6 Km

18. $\frac{p}{q}\left(\frac{r}{s}+\frac{t}{u}\right) = \left(\frac{p}{q}+\frac{r}{s}\right)+\frac{t}{u}$  is called

   A. Commutative property
   B.  Associative property
   C  Distributive property
   D. None of these
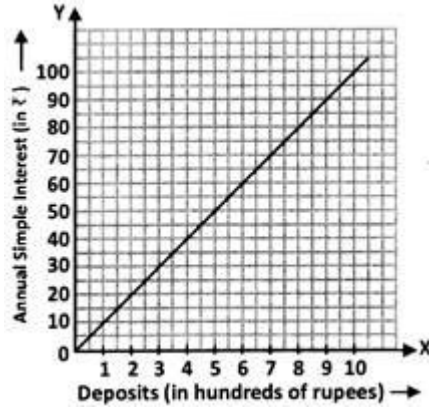
19. Observe the following pattern :

   13 = 1

   13 + 23  = ( 1 + 2 )2
   13 + 23 + 33 = ( 1 + 2 + 3 )2

   Calculate the value of 13 +  23 + 33 + …………. + 3 by the above pattern

A. 335
B. 225
C. 235
D. 215

20. The graph given shows the simple interest given on deposits in a bank.



Find the amount to be deposited to earn an interest of ₹ 45.
A. 250
B. 450
C. 400
D. 550

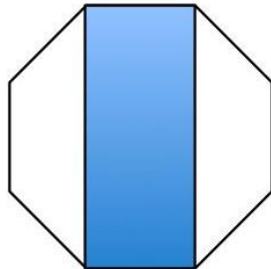21. Evalaute :

$$\left(\frac{\sin 77^0}{\cos 13^0}\right)^2 + \left(\frac{\cos 77^0}{\sin 13^0}\right)^2 - 2 \cos 2\ 450$$

A. 1
B. -1
C. 3
D. -3

22. The figure shows a regular octagon
What is the area of the colored part as a fraction of the area of the entire octagon ?



A. 60 %
B. 70 %
C. 50 %
D. 80 %

23. What is the difference between the sum of numbers in the seventh and third columns ?

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 |
| 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 |
| 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
| 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
| 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 | 108 | 109 |

A. 66
B. 55
C. 77
D. 88

24. Which fraction of the triangle is shaded ?
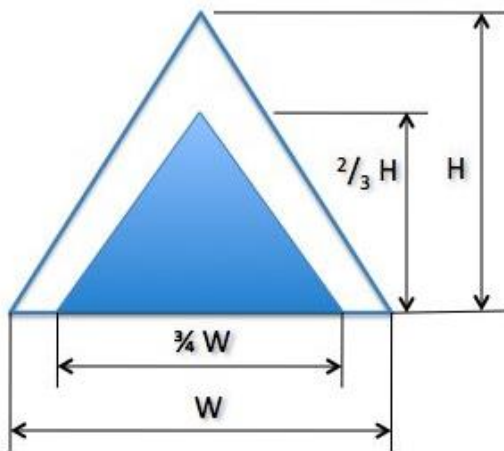


A. $\frac{1}{3}$

B. 0.5

C. $\frac{2}{3}$

D. 0.6

25. Which statement is correct ?
    'even' is an even number;
    'odd' is an odd numbe;
    Evens = 2Z = { ........., -6 , -4, -2, 0 , 2, 4, 6.......}
    Odds = 2z = { ........., -5 , -3, -1, 1 , 3 , 5 ..........}

    A. Odd × Odd = Even
    B. Even + Odd = Even
    C.  Even – odd = odd
    D. Even × Odd = odd

26. John is building a flight of stairs. Each stair is the same size.
    What is the height of the flight of stairs X ?
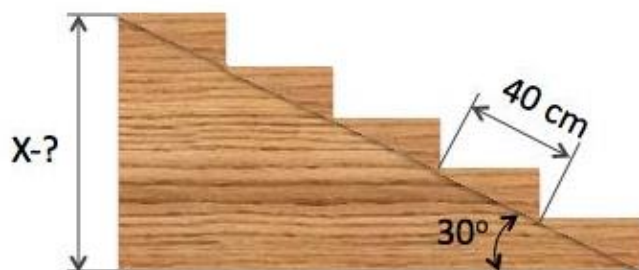


    A. 200 cm
    B. 80 cm
    C. 100 cm
    D. 50 cm

27. The base of the pyramid is a square. How many layers are there in such a pyramid,
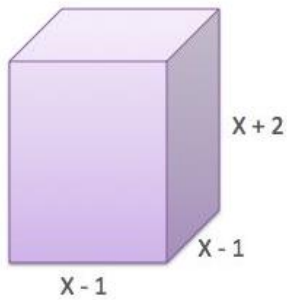    composed of 140 balls ?



    A. 7layers
    B. 8 layers
    C. 9 layers
    D. 10 layers

28. What is the volume of the figure , if X = 4 ?



X + 2

X - 1

X - 1

A. 50
B. 54
C. 56
D. 52

29. Which of the following numbers are divisible by 2, 5 and 10?

(i) 149

(ii) 19400

(iii) 720345

(iv) 125389

30. A car travels 125 miles in 3 hours. How far would it travel in 5 hours?

A. $208 \frac{1}{3}$ miles

B. $435 \frac{1}{8}$ miles

C. $345 \frac{1}{6}$ miles

D. $100 \frac{1}{2}$ miles

## SECTION C – EVERYDAY MATHEMATICS

31. Brody takes a 36 – centimetre by 48 – centimetre rectangle of plywood and uses a table saw to cut from one corner of the piece of plywood to the diagonally opoosite corner. Now Brody has two equally sized triangles of plywood. What is the perimetre of each triangle?

    A. 100
    B. 169
    C. 135
    D. 144

32. Sathish takes 24 minutes to reach his school, travelling at 15 km /hr. At what speed must he go to reach his school in 18 minutes ?

    A. 20 Km / h
    B. 30 Km / h
    C. 24 Km / h
    D. 18 Km / h

33. A Path 1 m wide is built along the border and inside a square garden of side 24 m . Find the area of the path and the cost of planting the grass in the remaining portion of the garden at the rate of ₹ 40 per m $^2$.

    A. ₹ 18360
    B. ₹ 23650
    c. ₹ 19370
    D. ₹19360

34. In the given figure, find the value of x.
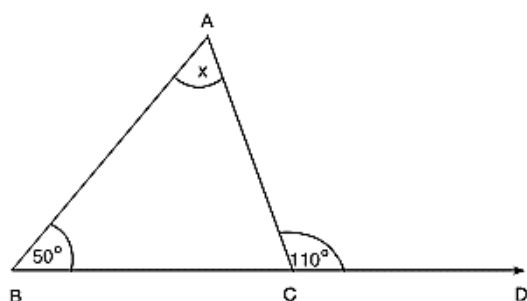


    A.60$^0$
    B. 45$^0$
    C. 90$^0$
    D. 80$^0$

35. In an election , candidate A got 70 % of the total valid votes. 20 % of the total votes were declared invalid. If the total number of votes is 600000, find the number of valid votes polled in favour of the candidate.

A. 226000
B. 336000
C. 116000
D. 227000

36. Some letters are missing in the given series and shown by (? ) Find out the correct alternative?



A. 10878
B. 10899
C. 10879
D. 12879

37. Find the amount at the compound interest on ₹ 4000 for 2 years compounded annually, the rate of interest being 5 % per annum during the 1 st year and 8 % per annum during the second year.

A. ₹ 653
B. ₹ 536
C. ₹ 745
D. ₹ 876

38. If 2 men or 3 boys take 40 hours to do a certain piece of work , how long will 4 men and 9 boys working together take to complete the work ?
A. 7 hours
B. 8 hours
C. 10  hours
D. 12 hours

39. Mr. Mukerjee's monthly salary is ₹ 16,000 . He spends $\frac{1}{4}$ of his salary on food. Out of the remaining , he spends $\frac{3}{10}$ on house rent and $\frac{5}{24}$ on the education of children. Find how much money is still left with him .

A. ₹ 6785
B. ₹ 6980
C. ₹ 5900
D.  ₹ 8900

40. Michael is 6 times as old as his granddaughter Laura. If laura's present age is x years and in 15 years time, michael will be 3 times as old as laura. Write an equation in x and hence find the present age of laura.

    A. 25 Years
    B. 20 years
    C. 10 Years
    D. 30 Years

## SECTION D – ACHIEVERS SECTION

41. Select the correct match.
    Let f (x) = $\frac{(x-8)(x^2-9)}{x^4}$

    (A) f(x) is a          As $(x-8)(x^2-9), x^4$
        polynomial        are polynomials

    (B) f(x) is an         As it can be written as
        equation          ax2 + bx + c

    (C) f(x) is a          As it is of the form $\frac{p}{q}$ ,
        rational number    q ≠ 0

    (D) f(x) is a not a    As the exponents of x
        polynomial        are not whole numbers.

42  One face of a rectangular box has an area of 15 square cm. Another face is 20 square cm and the other face is 12 square cm.
    What is the height , h of the box ?
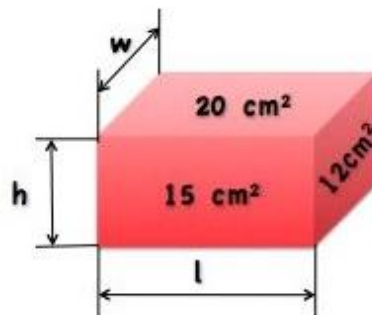


    A. 2 Cm
    B. 3 Cm
    C. 4 cm
    D. 5 cm

Study the following graph and table carefully and answer the questions given below:
TIME TAKEN TO TRAVEL ( IN HOURS ) BY SIX VEHICLES ON TWO DIFFERENT DAYS
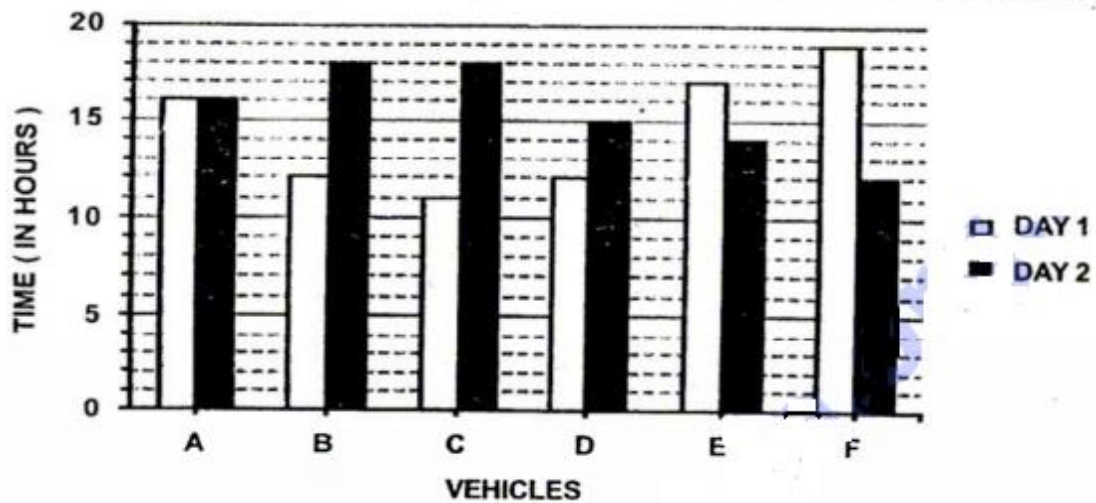


DISTANCE COVERED ( IN KILOMETERS ) BY SIX VEHICLES ON EACH DAY

| Vehicle | Day 1 | Day 2 |
|---------|-------|-------|
| A | 832 | 864 |
| B | 516 | 774 |
| C | 693 | 810 |
| D | 552 | 765 |
| E | 935 | 546 |
| F | 703 | 636 |

43. Which of the following vehicles travelled at the same speed on both the days ?

A. Vehicle A
B. Vehicle C
C. Vehicle B
D. Vehicle F

44. What was the speed of vehicle C on day 2 in terms of metres per second ?

A. 15.3
B. 11.5
C. 12.8
D. None of these

45. The wingspans of different species of birds is given below.

| Species of birds | Blue jay | Golden eagle | Seagull | Albatross |
|---|---|---|---|---|
| Length of wingspans | $\frac{41}{100}$m | $2\frac{1}{2}$m | $1\frac{7}{10}$m | $3\frac{3}{5}$m |

How much longer is the wingspan of a Golden eagle than the wingspan of a Blue jay?

A. $\frac{209}{100}$ cm

B. $\frac{209}{100}$ m

C. $\frac{9}{100}$ m

D. $\frac{215}{100}$ cm

46. The histogram representing the marks obtained by 60 students in a Mathematics examination. What is the total number of students who obtained more than or equal to 80 marks in the examination?
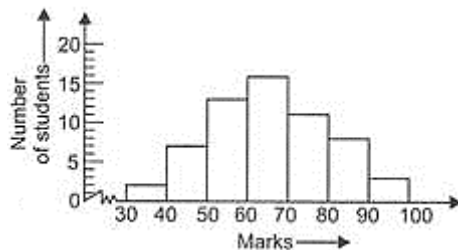


A) 13
B) 3
C) 8
D) 11
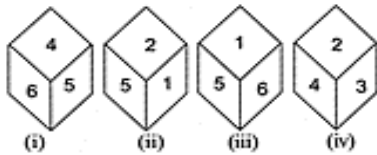
47. ABCD and MNOP are quadrilaterals as shown in the following figure :
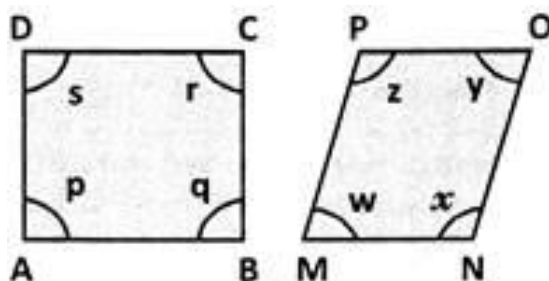


Which of the following is correct?

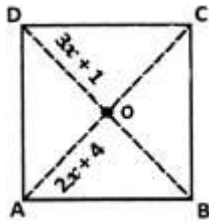A. P + q + r + s = w + x + y + z

B. p + q + r + s < w + x + y + z

C. p + q + r + s > w + x + y + z

D. Either ( B) or (C )

48. Which number lies opposite to the face 4 , if the four different positions of a dice are as shown in the figures given below ?
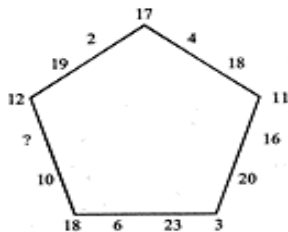


A. 5

B. 3

C. 2

D. 1

49. ABCD is a rectangle. Its diagonals meet at O. Find x; if OA = 2 x + 4 and OD = 3x +1



A. 2

B. 3

C. -3

D. -2

50. Which number should replace the question mark ?



A. 10

B. 20

C. 40

D.30